

The test data show that initially the bearing pad is not sustaining the applied load due to the compression of the soft neoprene materials. As the applied load continues to increase, the compressive strength is mobilized. As shown in Figures 42 and 43, the compressive strain where this situation occurs depends on each measuring device and is most likely to be affected by the slight uneven compression surfaces of the plates used in the test setup (Figure 41). Based on the averages of these measurements it was determined that the compressive stiffness starts to increase at a compressive strain of 0.035 inch/inch and 0.9 inch/inch for the Type V and Type VI bearing pads, respectively. It can also be observed that the Type VI bearing pad has a higher compressive capacity than the Type V bearing pad. In this case, the compressive modulus for the Type V is estimated equal to approximately 3000 psi versus 6000 psi for the type VI. According to Yura et al (1995), the hardness of the material and the shape factor influence the bearing pad compressive behavior. The compressive stiffness increases with the increase of hardness values.

Summary

The performance testing program aimed at characterizing the rotational stiffness of the substructure to superstructure connection within the bridge system taking into the account the relative stiffness of the other components. The program included testing of Type V and VI bearing pads under the combined action of compression and shear, and testing of the bearing pads in pure compression.

The shear index testing provided shear modulus values of Type V and Type VI bearings pads. In general, these measurements were similar to those measured by Yura et al. (2001), but extended those results to higher axial loads. The data also indicated that the behavior of these bearing pads under combined shear and compression was highly nonlinear, and that energy dissipation tended to increase as the axial load was increased.

Data from the compression tests provided some compressive properties of the bearing pads under study. Measured elastic moduli of the Type V pads were approximately half that measured for the Type VI pad. The information from these index tests will be used